

be subdivided into a plurality of stages, allowing fine evaluation values to be derivable.

[0027] The first feeling deduction unit **102** deduces the user's feeling by performing nonverbal action understanding based on paralinguistic information or nonverbal information on the basis of outputs of various sensors, i.e., outputs of the camera **14** that is an image sensor, the biological sensor **15**, the motion sensor **16**, and the microphone **17**. As compared with the second feeling deduction unit **104**, the first feeling deduction unit **102** is characterized in that the user's feeling is deduced not being on the basis of the contents of the speech.

[0028] The first feeling deduction unit **102** extracts changes in facial expression, a gaze direction, a hand gesture, etc., of the user from the photographed image of the camera **14** and deduces the user's feeling. The biological sensor **15** is attached to the user and detects biological information such as a user's heart rate and user's sweating state. The first feeling deduction unit **102** derives the user's mental state from the biological information and deduces the user's feeling. The motion sensor **16** is attached to the user and detects the user's motion, and the first feeling deduction unit **102** deduces the user's feeling from the user's motion. Note that a role of the motion sensor **16** may also be substituted by analyzing the photographed image of the camera **14**. Further, the first feeling deduction unit **102** deduces the user's feeling from the audio signal of the microphone **17** using a feature amount of the paralinguistic information. The paralinguistic information includes information such as speech speed, volume, voice inflection, intonation, wording, etc. The first feeling deduction unit **102** collects the user's feeling deduced from each of the outputs of the various sensors as one evaluation value for each evaluation index, and provides the evaluation value to the internal state management unit **110**.

[0029] The second feeling deduction unit **104** deduces the user's feeling on the basis of the contents of the user's speech. More specifically, the second feeling deduction unit **104** performs natural language understanding for audio analysis of the contents of the user's speech from the output of the microphone **17**, and then, deduces the user's feeling. Known algorithms may be used for natural language understanding techniques. If the user speaks that "I did it. I've got a home run" while playing the baseball game, the second feeling deduction unit **104** may deduce the feeling of the "joy" index of the user as "positive," whereas if the user speaks that "I have given up a home run," the second feeling deduction unit **104** may deduce the feeling of the "joy" index of the user as "negative." The second feeling deduction unit **104** provides the evaluation value of the deduced user's feeling to the internal state management unit **110**.

[0030] The event detection unit **40** detects occurrence of the event in the object control system **1** and notifies the third feeling deduction unit **106** of contents of the occurred event. Regarding a game event, by performing the game program on an emulator, the emulator may detect an event such as a home run, so that the event detection unit **40** may be notified of the event from the emulator. Note that the event detection unit **40** may detect a home run event by referring to an access to performance data being reproduced at the time of a home run, or by the performance actually displayed on the display apparatus **11**. The third feeling deduction unit **106** deduces

the user's feeling from the notified event contents, and provides the evaluation value to the internal state management unit **110**.

[0031] Note that the event detection unit **40** may be provided with an event occurrence timing from the external server that stores big data. For example, in a case in which the information processing apparatus **10** reproduces movie content, the event detection unit **40** acquires, in advance from the external server, a correspondence relationship table between time information of a scene of interest of the movie content and a deduced user's feeling in the scene of interest. The information processing apparatus **10** provides the correspondence relationship table to the third feeling deduction unit **106**. When the time of the scene of interest arrives, the event detection unit **40** notifies the third feeling deduction unit **106** of the time information. The third feeling deduction unit **106** refers to the correspondence relationship table to acquire the user's feeling being associated with the time information, and deduces the user's feeling in the scene of interest. As described above, the third feeling deduction unit **106** may deduce the user's feeling on the basis of the information from the external server.

[0032] In the internal state storage unit **130**, the object internal state storage unit **132** stores an internal state of the robot **20** that is an object, and the user internal state storage unit **134** stores an internal state of the user. The internal state of the robot **20** is defined at least by the feeling of the robot **20** and the robot **20**'s popularity rating for the user, and the internal state of the user is defined by the user's feeling and the user's popularity rating for the robot **20**. The popularity rating is generated on the basis of evaluation values of a plurality of the latest feelings up to the present, and is evaluated by a long-term relationship between the user and the robot **20**. The internal state of the robot **20** is derived from the speech and action of the user with respect to the robot **20**.

[0033] The internal state management unit **110** manages the internal state of the robot **20** and the internal state of the user on the basis of the user's feeling deduced by the feeling deduction unit **100**. Hereinafter, the internal state of the user will be described first, and then, the internal state of the robot **20** will be described. The "feeling" of the user is set by the feeling deduced by the feeling deduction unit **100**. The internal state management unit **110** updates the evaluation value in the user internal state storage unit **134** on the basis of the feeling deduced by the feeling deduction unit **100**.

[0034] When the evaluation value of "positive" is provided from the feeling deduction unit **100** for the feeling index of the user, the internal state management unit **110** updates the evaluation value of the feeling index to "positive," and when the evaluation value of "negative" is provided, the internal state management unit **110** updates the evaluation value of the feeling index to "negative." Here, "update" means a process of overwriting the original evaluation value in the internal state storage unit **130**. Even in a case in which the original evaluation value is "positive" and the evaluation value to be overwritten is "positive," i.e., there is no change in the evaluation value, such case is called to "update" the evaluation value.

[0035] Note that the feeling deduction unit **100** deduces the user's feeling with the three systems including the first feeling deduction unit **102**, the second feeling deduction unit **104**, and the third feeling deduction unit **106**, so that it may